

5th Annual Smart Grids & Cleanpower 2013 Conference  
5 June 2013 Cambridge

[www.cir-strategy.com/events/cleanpower](http://www.cir-strategy.com/events/cleanpower)

# Distributed Energy storage at the edge of the grid

Chris Wright, CTO



# HYBRID POWER SYSTEMS

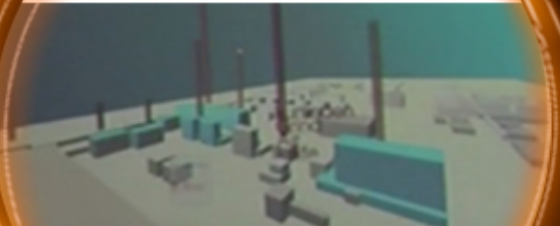


## SMART BATTERIES



**USBCell™**

## SMART ENERGY ANALYTICS



**THE ENERGY PROJECT**

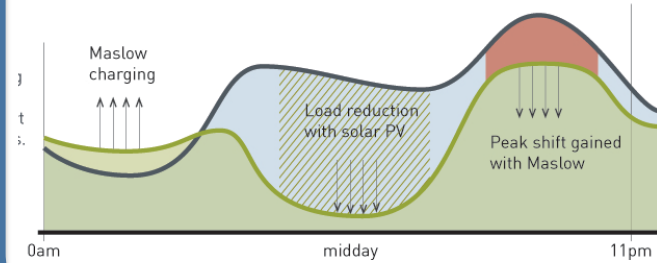
# Storage at the edge of the grid

Increasing value pushing storage to the edge:

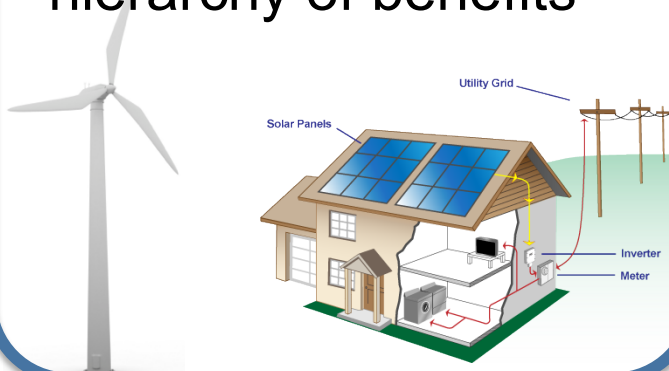
## increasing DC load



## time shifting energy



## hierarchy of benefits



global  
value /  
support

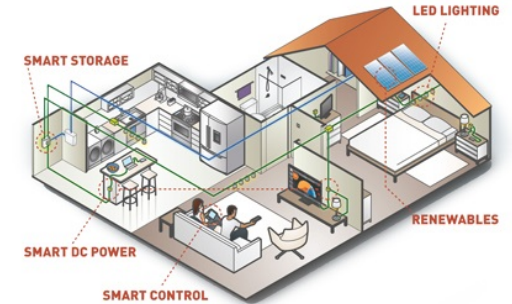


# Developing & deploying

Residential installs, theatre in London, DECC project



Arcola theatre,  
east London.

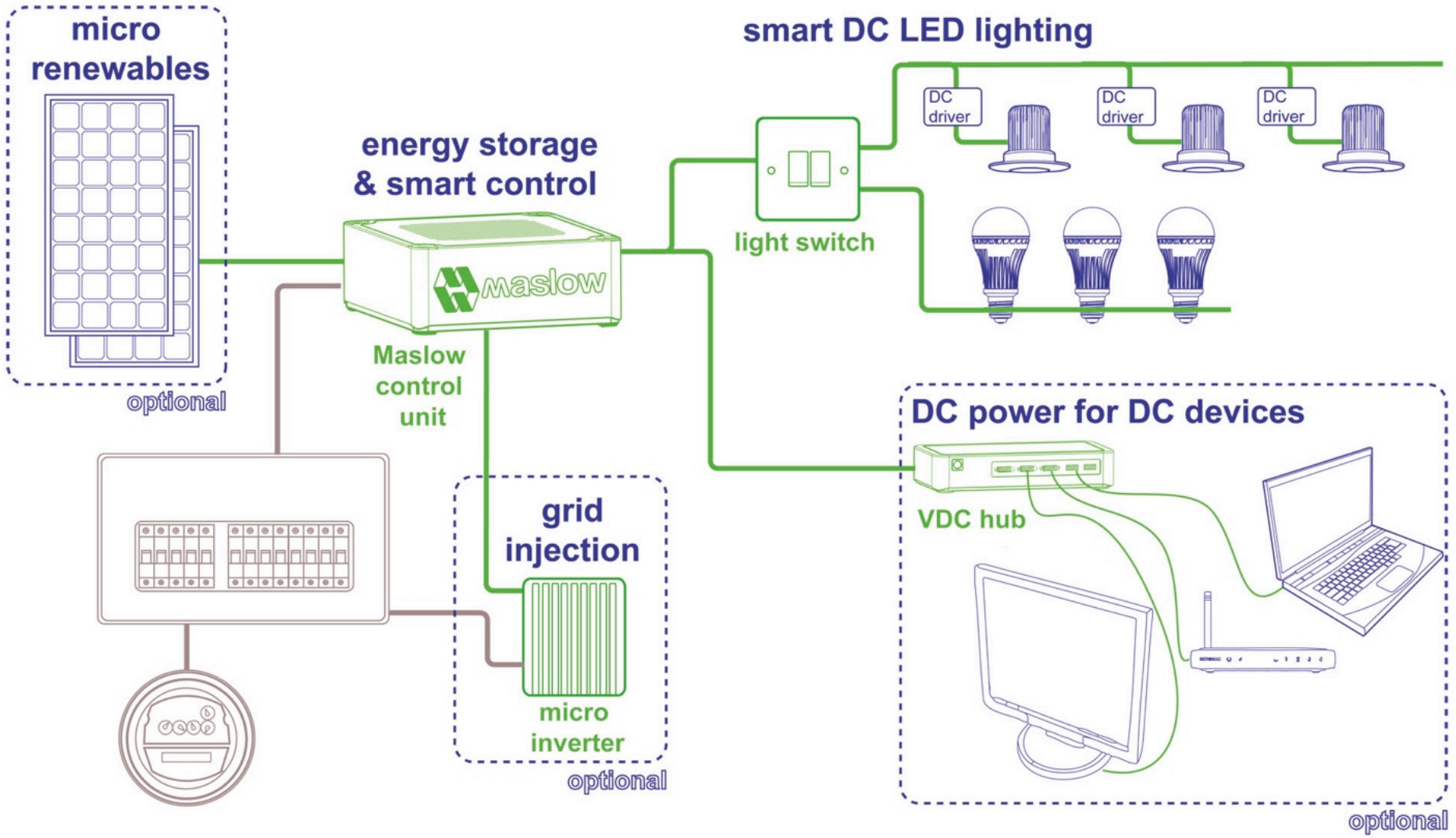


Residential trials

Design for 1.2MWh  
demonstrator  
in 750 homes



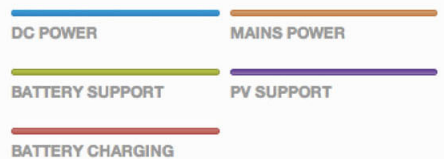
Department  
of Energy &  
Climate Change



# Time-shifting energy use

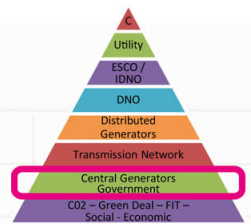
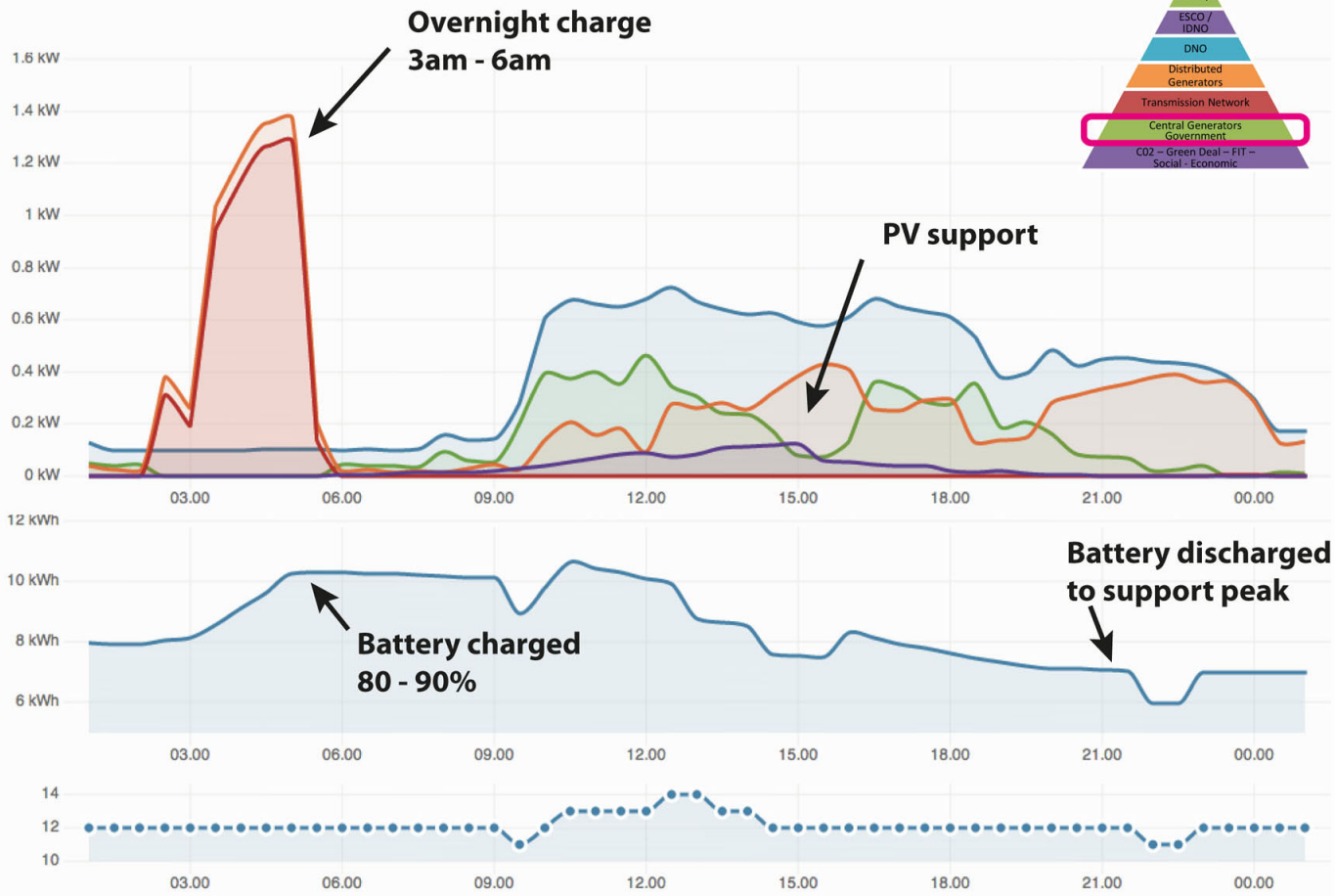
Store off-peak or renewable generation, use at peak

## Yesterday



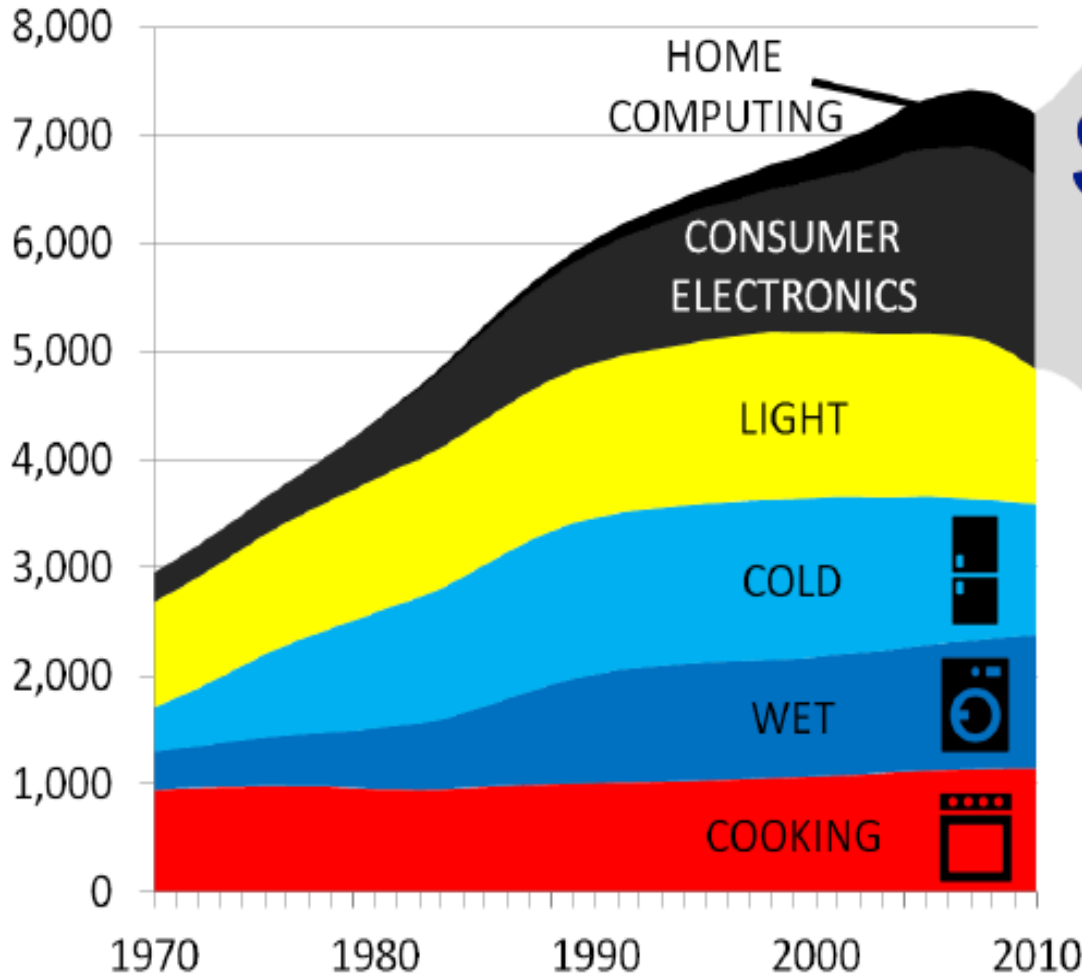
**6.99 kWh**  
STORED ENERGY

**12**  
MASLOW UNITS ONLINE



# Growing DC electricity use

It is always on ICT & electronics that is driving growth




Source: Pilgrim Beart via Moixa/DECC

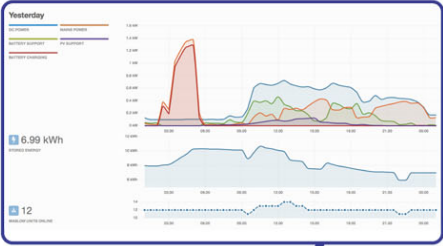
# Maslow system architecture

Distributed architecture, cloud based control, scalable

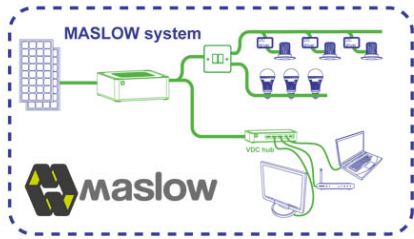
## MWh brokerage



## system performance



## user benefits



RESTful JSON API

ethernet

GPRS

WiFi

## network issues

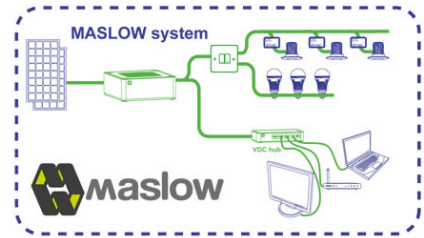


push data  
1 min JSON

push data  
1 min JSON



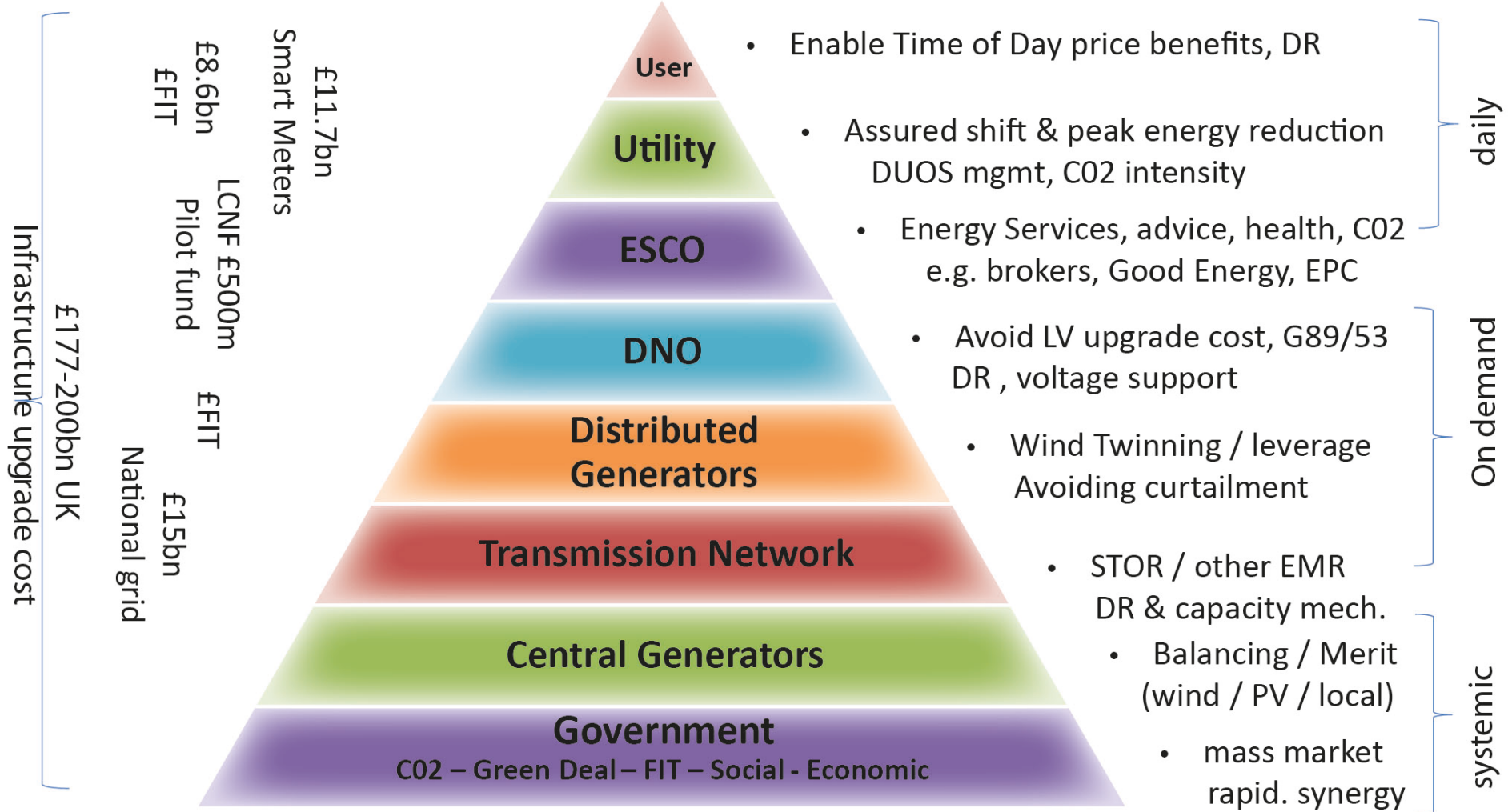
## wind balancing





# Hierarchy of network needs

Storage at the edge of the grid, multiple participants





AVC install partner  
SKY installer  
installing 40k / week  
optimising process



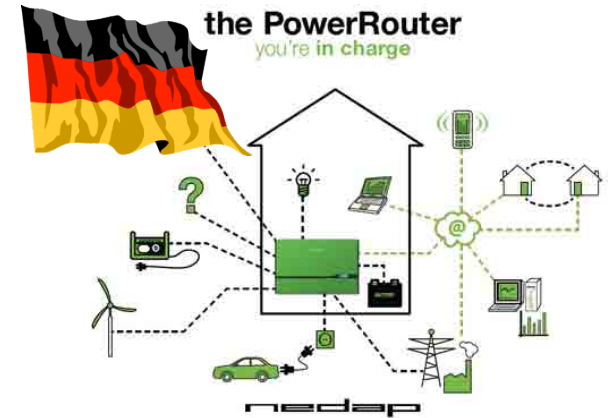
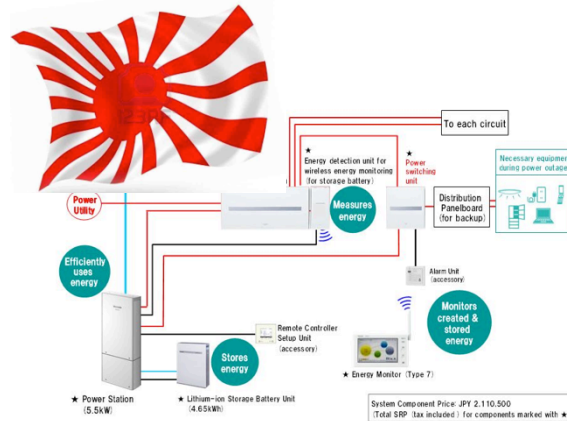
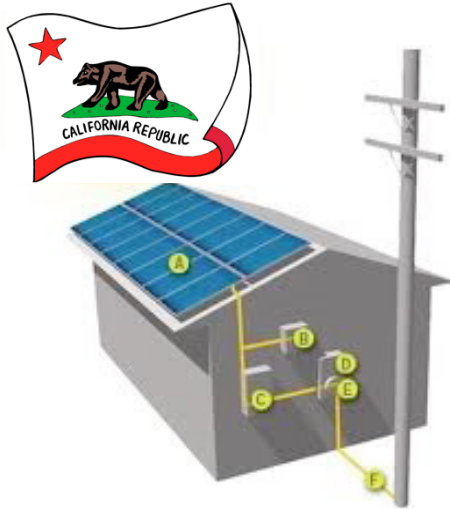
Green utility  
engaged customers  
need wind twinning  
custom local tariffs



Demand aggregator  
Control infrastructure  
NG & local services  
Maslow integrated

# Global growth in distributed

Subsidy / customer pull only for systems at the edge



## California

network pays capex  
subsidy to end users  
SGIP/SB412 @ \$2/Wh

## Japan

end customers pay for  
resilience  
Sharp / Panasonic etc


## Germany

subsidy given solar /wind  
balance benefit  
active from 1<sup>st</sup> May

# Maslow – energy future



- energy storage at the edge of the grid
- energy resilience for consumers
- time shift energy use

Powered by  maslow

- multiple use layers / money
- affordable / scalable technology
- network benefits of storage

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